

REMARKS

In Section 3 of the Detailed Action dated 12/04/02 (herein referred to as the Detailed Action),
5 the Examiner rejects Claim 1 as being indefinite for failing to particularly point out and distinctly
claim the subject matter which applicant regards as the invention. Examiner posed the following
question and requested clarification:

“If the color change is due to a difference in temperature, then how
can the **number** define a *future* ullage or an amount in a container
10 if the color change is temperature dependent?”

In response to the Examiner’s question we offer the following clarification: We refer to the
indication (**number**) as *future ullage* because a pressure drop or volume shortage *will not be*
evident (by use of a pressure gauge) *until the tank has cooled* to a particular temperature. The
reason is that, at the time of filling a container of compressed gas, a pressure and volume ullage
15 can occur in proportion to temperature. The temperature sensitive coating reacts to a change in
temperature of the container revealing the **number**. The **number** shows the ullage as a **pressure**
drop or **volume** shortage *to expect (i.e. future)* based upon *when the said container cools to a*
particular temperature.

Referring to Page 3, Section 5, Paragraph 1 of the Detailed Action, in response to the
20 Examiner stating “The device disclosed is capable to be *adapted* to indicate a number of
indicating quantities depending upon application so long as the process for staying within the
color-tolerance ranges of the indicator. The color tolerances determine which color is displayed
and when.” We disagree with this statement for the following four reasons.

- 25 1. Temperature Ranges Examiner states “...so long as the process for staying within
the color-tolerance ranges...” The temperature ranges described in Suzuki’s claims
are far too narrow and limited to be relevant to our application. Suzuki states in the
background of his invention, column 1 line 30, that “Physiologically active
substances, especially blood, are used in large quantities. They are commonly either
30 frozen or refrigerated at about 1°-8° C.” Compressed gas cylinders are filled and
used in virtually all environments on earth. This means that various forms of our

invention could range from 0°C to 100°C as a starting temperature. This is a much wider range than Suzuki's invention could maintain.

2. Monitoring and Limits Suzuki's claims refer to "a time-temperature monitoring" device of a container. Our device does not monitor the temperature of a container, nor will it advise a "condition" of the contents of the container, unlike Suzuki's device. In addition, Suzuki's device imposes a time-temperature limit that would make it impossible to adapt for use as our invention while remaining within the scope of Suzuki's claims.
3. Condition vs. Quantity Suzuki states in column 3 line 55 that his invention results "...in a change in the suitability of the article for a useful purpose." Suzuki's device discloses the condition (quality) of the item within the container, but discloses nothing regarding quantity. Our invention makes no reference to condition or quality of the contents of the container, but to quantity in the container.
4. Fundamental Structure Suzuki references in claim numbers 1 and 2 an irreversible phase of inks. All of Suzuki's other claims reference claim numbers 1 and/or 2. In other words, Suzuki must have non-reversible inks in order for his invention to work. Removing the irreversible inks to make his product adaptable to our use would result in a fundamental change of Suzuki's product; therefore it can not be adapted to meet the requirements of the claims of an ullage meter.

Continuing to Section 5, Paragraph 2 of the Detailed Action, Examiner states: "In reference to Claim 1, Suzuki discloses a cholesteric liquid crystal formulation suitable to use as an indicator of time and/or temperature." We do not agree with the Examiner that this statement is correct. We believe that the Examiner has added or inferred information that is not stated within Suzuki's claim. Suzuki's Claim #1 states "Time/temperature-monitoring means comprising a cholesteric liquid crystal material..."The Examiner has inferred that time/temperature has the same meaning as time AND temperature, which it does not. In Suzuki's column 3 line 53, within the *Summary of the Invention*, Suzuki states that "The invention finds use in preparing an indicator suitable for detecting when an article has met or exceeded a thermokinetic limit. The thermokinetic limit is a function of *both temperature (energy) and time (rate)*, resulting in a change in the suitability of the article for a useful purpose."

Also, in Section 5, Paragraph 2 of the Detailed Action, the Examiner refers to our claims as obvious in regard to prior art by Suzuki. Examiner states "Since this device is utilized using color changes, both reversible and irreversible, to indicate a temperature change within
5 predetermined temperature limits, then one of ordinary skill in the art would be able to adapt this device to be used in a manner which is described in the claims." There are two incorrect assumptions in this statement. The first is the Adaptability of Suzuki's invention to fit our claims, and the second is the statement that our claims are determined Obvious under 35 USC § 103.

10
1. Adaptability. We traverse the Examiner's contention that Suzuki's invention could easily be adapted to fit our claims. This is because there is no equivalent in Suzuki's claims to determining quantity. Suzuki only shows temperature and, being time dependent, if the item in the bag has expired. When reviewing claims using the
15 element by element approach and the doctrine of equivalent analysis, it is clear that Suzuki makes no claims for quantity within a container. The CAFC has stated in *Lemelson v. United States* 752 F.2d 1538, 224 USPQ 526 (CAFC 1985) that infringements may not be found either literally or under the doctrine of equivalents where the accused device lacks an element of the claimed invention and has no
20 equivalent *of that element*.

- Note: In an attempt to show the adaptability of Suzuki's device into ours, the Examiner incorrectly inserted Suzuki's device into the wording of our claim, **rewording our claim to fit into Suzuki's device**. The claim is correctly paraphrased until "...the number indicating a condition when the contents of
25 the container have reached a particular temperature." The claim should have read "...the number defining the [future] ullage on said container once it has cooled to a particular temperature." The difference is Suzuki's states a **condition** for the contents of the container at a heightened or elevated temperature. Our claim states a **measure** of pressure or volume that is
30 dependent upon the container cooling and will not be evident until the container cools. In short, Suzuki's tells the condition of the contents when the

container warms, ours tells the expected quantity or quantity shortage to expect when the tank cools.

As Examiner states in his Section 4 of the Detailed Action, the statutory basis of rejection due to obviousness is 35 USC §103. A key point that must be considered within this statute is "that **the subject matter as a whole** would have been obvious at the time the invention was made." The court has stated that it is proper to consider the conception of a new and useful improvement along with the actual means of achieving the improvement. See *In re Horton* 121 USPQ 218, 219 (CCPA 1959).

According to the court: "...though the structure may be but a simple expedient when the novel concept is realized, that structure may not be obvious to the skilled worker in the art where the *prior art has failed to suggest the problem or conceive of the idea for its elimination.*"

In Suzuki's claims there is no mention of quantity, ullage, pressure drop, pressure, lack of being full, compressed gas cylinders or the like. Suzuki's patent "Did Not Teach" to determine ullage, pressure drop, or similar in pressurized containers. Therefore, according to the rulings stated above, the submitted claims for an ullage meter would be considered non-obvious.

In addition, the following CAFC rulings have stated that these advantages stated in prior art, must be a *plain* (clearly stated with little room for interpretation) suggestion to invalidate a new invention's claim.

In *Fromson v. Advance Offset Plate* 755 F.2d 1549, 225 USPQ 26 (CAFC 1985). The CAFC stated "Where, as here, nothing of record *plainly* indicates that it would have been obvious to combine separate process steps into one process, it is legal error to conclude that a claim to that process is invalid under §103."

In *Kimberly-Clark v. Johnson & Johnson* 745 F.2d 1437, 223 USPQ 603 (CAFC 1984) the CAFC, in reversing an obvious determination by the USPTO for a combination claim for a sanitary napkin stated its conclusion on obviousness as follows:

“...with the prior art, we have made it ourselves,
examining all the references of record, and we fail to
find a *clear* suggestion of the claim subject matter. The
invention which we find non-obvious is, however, that
5 which is specifically claimed in the patent in suit, a
narrow invention in a crowded art. The holding of
invalidity on the grounds of obviousness is therefore
reversed.”

In *King Instrument Corp. v. Otari Corp.* 767 F.2d 853 (CAFC 1985),
10 the CAFC stated “Nothing of record *plainly* indicated that it would have
been obvious to combine prior art.”

**Suzuki does not plainly state any advantages in his claim to modify or change
his invention in a means that could be used to determine quantity, ullage,
pressure drop, or adapting for pressurized containers.**

- 15
2. Obviousness. We traverse the Examiner’s contention that the submitted claims would
be considered obvious by using Suzuki’s claims. The federal circuit has consistently
held obviousness as a question of law based on factual inquiries mandated by
35USC§103¹. The factual inquiries include: scope and content of prior art, level of
20 ordinary skill in the art, differences between claims and the prior art, and secondary
considerations².

Suzuki’s device is specifically for monitoring limits of the contents of a blood bag
or other container for physiologically/biologically active substances (blood, organs,
etc.) in the medical field. Suzuki makes no claim for use outside of the medical
25 industry.

When Suzuki’s claims are read in light of the specification, one skilled in the art
would understand the bounds of the claim (i.e. must reasonable be apprised of the

¹ *Aktibolaget Karlstads Mekaniska Werkstad v. I.T.C.*, 705 F.2d 1565, 1575 (1983); *Stratoflex, Inc. v. Aeroquip Corp.*, supra note 9 at 713 F.2d 1535; *In re De Plauwe*, 736 F.2d 699, 703 (1984); *Vandenberg v. Dairy Equipment Co.*, 740 F.2d 1560, 1565 (1984); *Jervis B. Webb Co. v. Southern Systems, Inc.*, 742 F.2d 1388, 1393 (1984).

² *Jervis B. Webb v. Southern Systems, Inc.*, Supra note 27 at 742 F.2d 1393-1397.

scope of the invention) See *Miles Labs. Inc. v. Shandon Inc.*, 997 F.2d 870, 875, 27 USPQ 2d 1123, 1126 (Fed Cir. 1993). Clearly the scope of Suzuki's time/temperature monitor and the scope of our ullage meter are extremely different. Suzuki's invention only indicates temperature and is time-temperature dependent based on the radiation of heat. Our device's indications are based on temperatures of compressed gas and their containers to forecast the ullage resulting from pressurization; it is the pressurization process itself that causes the adiabatic changes in the temperature.

In addition, we believe that our device is not obvious referencing the case of *Graham v. John Deere*, 381 US1, 148 USPO 459 (1966) in which §5 states that secondary objective circumstances must be taken into account when deciding that an invention is not obvious. The federal circuit has elevated the importance of secondary considerations in the determination of obviousness. The federal circuit has ruled that even in a situation in which the prior art suggested the claimed invention to one of ordinary skill in the art and there was a prima facie showing of obviousness, **evidence of commercial success will require a finding of non-obviousness**. See *Simmons Fastener Corp. v. Illinois Tool Works, Inc.*, 739 F.2d 1573, 1575-1576 (Fed Cir. 1984); *In re Piasecki*, 745 F.2d 1468 (Fed Cir. 1984).

The following secondary objective circumstances of Commercial Success, Long Felt but Unsolved Need, Failure of Others to Invent/Lack of Implementation further traverse the Examiners statement that our invention is obvious.

Commercial Success Since the official public release of the product in late Summer 2002 and through mid-November 2002 (a 5 month period), we have secured 2 international distributors (National Divers Mfg., and Trident Diving Equipment, the latter being the largest distributor of dive accessories in the world).

1. Trident Diving Equipment has ordered over 1200 units of the device (see addendum copy of invoice, copy of check remittance, and listing in catalog, pg. 20&21).

2. Combined, National Divers Mfg. and Trident Diving Equipment market our device to every state in the U.S. and have the means to distribute to over two dozen foreign countries.

3. We have received many requests from foreign distributors and are in negotiation to produce a metric version for distribution and sale outside of the United States (see attached copy of business cards from foreign distributors).

Long Felt but Unsolved Need This objective was stated in our initial rebuttal. However, to prove this point, we have included a sampling of the replies and responses we have received from people regarding our device (see addendum Public Responses).

A sub-category under "Long Felt but Unsolved Need" which deserves consideration, is that of **Professional Recognition**. In addition to the public stating a Long Felt but Unsolved Need (see addendum Public Responses mentioned above), the invention has been recognized in a professional publication as one that helps solve a problem that has existed for divers and was not addressed until this invention. See included copy of *California Diving News*, August 2002, page 18.

Failure of Others to Invent/Lack of Implementation Clearly, as stated under the category "Long Felt but Unsolved Need" and Professional Recognition as such, there is a definitely a need for this invention and it had yet to be solved. This poses the question, "If it is so obvious, why hasn't anyone in this field invented such a device before? If it is so obvious why hasn't anyone adapted Suzuki's device for this use?" The answer is that this device is not obvious to one skilled in the art, nor is it obvious or stated as advantageous to alter or adjust Suzuki's invention to be usable in such a way to show quantity, pressure drop, ullage, or the like.

The Examiner states in Section 5, Paragraph 3 of the Detailed Action, "In reference to claims 4-6, one of ordinary skill in the art would be able to use such a device as disclosed by *Suzuki et al.* to indicate a variety of properties." Our reply to this statement is the same as above regarding 1) Adaptability and 2) Obviousness.

As the Examiner stated in Section 5, Paragraph 4 of the Detailed Action, "The device disclosed in Suzuki is configurable to meet different parameters." The definition of a parameter (according to Webster's dictionary) is a boundary or limitation. We believe the Examiner
5 misunderstood the scope and meaning when comparing these inventions. Suzuki's invention shows when a biological item (usually blood) is nearing or has passed its boundary of use due to a certain time/temperature threshold being crossed. In other words, Suzuki's invention shows when the product inside the bag has expired. Our invention does not show limits, expirations, or boundaries as suggested by the terminology "Different Parameters". Our invention indicates
10 ullage (quantity) that a freshly filled container will have when it cools to a particular temperature, which is caused by heat increase as a result of the adiabatic process from filling.

Continuing with Section 5, Paragraph 4 of the Detailed Action, the Examiner states that Suzuki's invention is "configurable to meet different parameters **as desired by a user**", and as a result the submitted claims would be considered obvious. In addition to the rulings we cited
15 previously in which claims must be plainly stated for adaptation to be considered obvious, CAFC rulings have stated that the prior art **must mention the desirability to combine the new elements** in the claims, otherwise new elements must be considered non-obvious³. Suzuki does not mention quantity, ullage, lack of being full, compressed gas cylinders or the like nor does Suzuki suggest or imply the **desirability** of incorporating these elements into his invention.

20 Responding to Section 7 of the Detailed Action, the Examiner references our Claim 1, regarding the addition of a limitation to the preamble "while said particular temperature prevails." This phrase was added to explain that the color change is temporary. In other words, the color change on the coatings will 'reverse' once the temperature has decreased below the
25 particular threshold temperature affecting a particular coating. Suzuki's invention requires irreversible inks, and without them his invention would fail. On Suzuki's device, the

³ *Fromson v. Advance Offset Plate*, 755 F.2d 1549, 1556 (CAFC 1985); *Lindermann Maschinenfabrik v. American Hoist and Derrick*, 730 F.2d 1452, 1462, 221 USPQ 481 (CAFC 1984); *Vandenberg v. Dairy Equipment Co.* 740 F.2d 1560, 1566, 224 USPQ 195 (CAFC 1984); *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929 (CAFC 1984); *Environmental Designs v. Union Oil Co. of Cal.*, 713 F.2d 693, 698, 218 USPQ 865 (CAFC 1983), cert. denied, 104 S.Ct. 709, 79 L.Ed.2d 173, 220 USPQ 520 (1984); *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 1582 (CAFC 1983).

temperature that prevails is permanent and therefore lower temperatures of ink can not return once that temperature has been exceeded. The claims for the ullage meter do not employ irreversible segments and because of this reason the claims for the inventions are not interchangeable.

5

Responding to the Section 8 of the Detailed Action, the Examiner states, "There is no operational difference between the device disclosed in Suzuki and the device in the application that would not be outside the preview of one of ordinary skill and art. Suzuki's device uses experimentally determined limit temperatures and color retention time to indicate changes in a container." We believe this statement is incorrect because of the following reason. Suzuki's device is time-temperature dependent, its operation is dependent upon the temperature and a specified time period to indicate a change of condition to the contents of the container. Our device is not dependent on time, nor is time relevant to the device. Our device bases assumptions and calculations on the adiabatic temperature increase from pressurization and on a cooling (ending) temperature, not the amount of time the container or its contents are at a specified temperature. Our device is not an expiry indicator, but rather a meter of shortage. The amount of time spent at a particular temperature and the length of time it takes to reach a certain temperature are irrelevant to our application while they are the focus of Suzuki's device.

20 In response to Section 9 of the Detailed Action, the Examiner stated "A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art." *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458,459 (CCPA 1963).

We traverse the Examiner's position regarding structural difference and capability of performing the intended use.

30 Structural Difference It is not enough for the Examiner asserting invalidity to show that the prior art suggests the structure of the invention, where the invention offers advantages not suggested by the prior art. In other words **structure similarity is not**

enough to make a new claim invalid so long as the new invention offers *advantages that are not suggested by the prior art*⁴. Our invention offers the advantageous means of determining quantity, ullage, pressure, or pressure drop for pressurized containers none of which are suggested in the prior art.

5 Capable of Performing Non-reversible areas are a necessity for Suzuki's invention and are cited and/or referenced in all of his claims. A fundamental element of Suzuki's invention involves the structure containing time/temperature irreversible inks. When the temperature exceeds the threshold, the contents of the container are considered expired. This is critical because, if Suzuki only used reversible indicators, an expired bag and its
10 contents could be placed into a cooling unit and reversible liquid crystals would reveal the temperature of the contents of the bag and there would be no indication that the contents had expired. Suzuki relies on nonreversible means; he must have them for his time/temperature monitor to function. Our device uses reversible inks, handles a much broader temperature range than Suzuki's device can maintain, and discloses the essential
15 information of quantity (ullage, pressure, pressure drop). Clearly, Suzuki's device would be incapable of performing as our device.

We continue with our traversal of the Examiners reference to structural difference and capability of performing the intended use in the Examiner's cited cases of *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458,459 (CCPA 1963).

20 In re Casey, 152 USPQ 235 (CCPA 1967) We traverse the Examiner's opinion that this invention would be considered obvious with Suzuki's art as compared to the case of James H. Casey (patent appeal number 7718). This case is not applicable because it was determined that the difference between the two inventions was that of semantics. One was a "Tape Dispenser" while the other was called a "Perforating Device" and also a
25 "Tape *Dispensing* Machine". Both machines utilized a bristle brush surface in which the tape detached and adhered to while spinning from a feeding roll, then the tape is severed between two tape feeding blades by a cutting blade. The court stated "It seems apparent, therefore, that the position taken by appellant does not involve any unobvious differences between the *structure of his apparatus and that of Kienzel, but relates solely to the matter*

⁴ *Schenck v. Norton Corporation*, 713 F.2d 782, 785, 218 USPQ 698 (CAFC 1983); *In re Sernaker*, 702 F.2d 989, 996, 217 USPQ 1 (CAFC 1983); *Lindermann*, *supra* n. at 1462.

of the use of the device." As stated above, our submitted claims are significantly different from Suzuki's device, both in intended use and structure.

In re Otto, 136 USPQ 458,459 (CCPA 1963) The case of Carl Louis Otto (patent appeal number 6901) is also traversed as being not applicable to the submitted claims compared to Suzuki because we do not produce the same results. *In re Otto* involves the method of hair curling in which prior art utilized foam curlers that were soaked/coated with a fluid hair weave solution then applied with a rotary machine that would wrap the hair around the curler. The appellant in this case also discloses a method in which a machine is used to wrap a hair curler. The difference being that the appellant notes that the weaving solution used is applied to the curler in a dry form and applied to the hair then activated with fluid. It was noted that curlers in the prior art could also have been impregnated with a dry solution and it that the weave solution (water-soluble saponified thioglycolin-amonia) was available in both wet and dry forms when these claims were made, thus the manner of intended use was of no significance. The court compared this scenario to that of a housewife who uses a soapy sponge, then leaves it to dry (assuming the sponge was not rinsed out), upon re-wetting the sponge would still be soapy. In this case the manner of intended use was seen as no significance because both methods produce the same results, it is simply a question of which step water is added to activate the solution. **Our invention produces new and unexpected results as compared to Suzuki's invention. Therefore the manner of these inventions cannot be compared because we do not produce the same results.**

In response to Section 10 of the Detailed Action (citing *In re Van Geuns*⁵), Claim 1 has been removed and Claim 8 has been added. Claim 8 recites that common gas laws are used to calculate ullage.

In summary, Suzuki's patent "Did Not Teach" to determine ullage, pressure drop, or similar in pressurized containers. We find no teaching of our principles for measuring and indicating gas ullage in Suzuki. We are aware from our direct experience in the SCUBA diving world of the

⁵ *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

long-held need for divers to know the potential shortage of their air supply prior to leaving the filling area and before arriving at the dive site. Yet, our idea has not come forth and now we are seeing a large potential for its use. Thus, where is the obviousness?

5 THE SUMMARY OF ATTACHED MATERIALS
COUNTERING OBVIOUSNESS CHARGE

1. Trident Diving Equipment, 2003 product catalog, see product advertisement on page 20 and 21 and individual product listing on back cover. Example of Commercial Success.
2. Original of *California Diving News*, August 2002 issue. The product is featured in the
10 "New Gear" section on page 18. *California Diving News* is a well-respected industry publication. Example of Professional Recognition.
3. Copy of invoice to Trident Diving Equipment for their initial order of product. Example of Commercial Success.
4. Copy of check remittance from Trident Diving Equipment for their initial order.
15 Example of Commercial Success.
5. Copy of the cover of National Divers Mfg. The product is included in their new catalog, which they will be distributing in February 2003. Example of Commercial Success.
6. Copies of business cards from foreign distributors that have requested a metric version of the product for worldwide distribution. Example of Commercial Success.
- 20 7. Public Responses - Examples of Long Felt But Unsolved Need:
 - a. "Air Bubbles" Page 3. A newsletter for a dive club located in Boston, MA. Page 3 of the newsletter is an article written by member Rob Falk. The article, entitled "In Search of an Honest Fill" was written by Mr. Falk of his own accord.
 - b. Another unsolicited comment by Rob Falk on the club's website,
25 www.northshorefrogmen.com.
 - c. An email from a dive club member in Florida who has answered an offer from us to introduce the product to his club.
 - d. An email from a dive club member in Texas who has answered an offer from us to introduce the product to her dive club.
 - 30 e. An email from the Boeing Dive Club in Seattle, WA requesting some samples of the product.

- f. An email from a gentleman in Finland who publishes a dive magazine requesting information on the product for the purpose of an upcoming article.
- g. An email from a diver in Southern California who is requesting the ability to purchase the product online.
- 5 h. An email from a dive shop owner in London, England requesting a metric version of the device.

The materials we have listed and included here are only a sampling of many that we have received. The response has been overwhelming and further goes to show the commercial success and long felt need for the device.

10 We hope that the Examiner can now see our concept as something inventive and worthy of a patent.

Respectfully submitted,

Frank C. Price

Reg. No. 29841

15

A handwritten signature in cursive script that reads "Frank C. Price". The signature is fluid and elegant, with a large initial 'F' and 'P'.